an electrical power system controller that is to program the power and bus management circuits, via the communications grid, to set the high or low voltage at the harvested energy output node.

7. The system of claim **1** wherein each of the sub-arrays is composed of photocells each of which has an active or light detection area that is less than live (5) square millimeters in area, and wherein each of the sub-arrays has at least one thousand photocells and is to produce between 1 volt dc and 1000 volts dc.

8. The system of claim **1** further comprising a communications band decoder that is capacitively coupled to a sub-array power node, to decode information or data from a signal detected by the sub-array, wherein said information or data was embedded by a remote source of light that is illuminating the sub-array.

9. A dynamically reconfigurable energy harvesting photovoltaic (PV) system comprising:

a plurality of PV energy harvesting sub-arrays wherein each sub-array comprises

a group of multi-junction PV cells each of which has a plurality of photocell junctions that are optimized to produce electricity by absorbing a plurality of different wavelengths of light, and

a plurality of power management circuits each being associated with and coupled to a respective one or multiples of the multi-junction PV cells; and

a power grid to which a power output of each of the power management circuits is coupled,

wherein each or multiple subsets of the plurality of photocell junctions that make up a multi-junction PV cell is coupled to a separate Input port of the power management circuit associated with that multi-junction PV cell or plurality of multi-junction cells, wherein all of the energy harvested by all of the photocell junctions that make up the associated multi-junction PV cell or cells is provided to the grid through the output port of the power management circuit.

10. The system of claim **9** wherein the power management circuit is to automatically detect which one or more of the photocell junctions that make up the associated multi-junction PV cell is producing the lowest power and in response operate in a predetermined mode.

11. The system of claim **10** wherein in said predetermined mode, the photocell junctions producing the lowest power become disconnected from the output port.

12. The system of claim **9** wherein the power management circuit is to automatically detect which one or more of the photocell junctions that make up the associated multi-junction PV cell is producing the highest power and in response operate in a predetermined mode.

13. The system of claim **12** wherein in said predetermined mode, only the photocell junctions producing the highest power become connected in series with the output port.

14. The system of claim **9** wherein each of the power management circuits comprises a communication interface through which it can be programmed so as to connect the photocell junctions, which make up its associated multi-junction PV cell, one of a) all in parallel with each other, b) all in series with each other, or c) a combination of parallel, and series connections.

15. The system of claim **14** further comprising an electrical power system controller that is to signal each of the power management circuits to connect their photocell junctions in series with each other in response to a determination that energy harvesting is based on sunlight incident upon the multi-junction PV cells.

16. The system of claim **14** further comprising an electrical power system controller that is to signal a selected subset of the power management circuits to operate in a predetermined mode in response to a determination that energy harvesting is based on a light beam such as laser light or an incoherent light beam, rather than sunlight, that is incident primarily upon the multi-junction PV cells associated with the selected subset.

17. A method for operating an energy harvesting photovoltaic (PV) system having energy harvesting sub-arrays, cell power management circuits, sub-array power management circuits, and a programmable power grid, comprising:

a) receiving a plurality of performance indications from a plurality of cell power management circuits, respectively, that are associated with a plurality of sub-arrays in the system, respectively, wherein each sub-array has a pair of power output nodes that are coupled to a respective sub-array power management circuit;

b) signaling the power management circuits of low performing sub-arrays to disconnect those sub-arrays from a power grid;

c) signaling the power management circuits of high performing sub-arrays to connect those sub-arrays to the power grid;

d) signaling the bus management circuits to form current paths from the connected sub-arrays to a pair of harvested energy output nodes of the system based on the received performance indications and to maintain a predetermined system output voltage or system output power level,

repeating a)-d) so as to maintain the predetermined system output voltage or power level in the presence of changing illumination which results in changes to which of the sub-arrays are connected to the power grid, as per b) and c).

18. The method of claim **17** wherein the receiving of performance indications from the cell power management circuits, and signaling of the power and bus management circuits is performed by a satellite or aircraft EPS controller.

19. The method of claim **17** wherein at least one of the sub-arrays has multi-junction PV cells, the method further comprising the cell power management circuits associated with a multi-junction PV cell self configuring its current path switches based on having detected relative power or current levels of the individual junctions in the multi-junction PV cell.

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